Mapping Current Vegetation in the Pacific Coast States with GNN, CART, and Other Tricks

Landscape Ecology, Modeling, Mapping, and Analysis (LEMMA) team *(www.fsl.orst.edu/lemma)*

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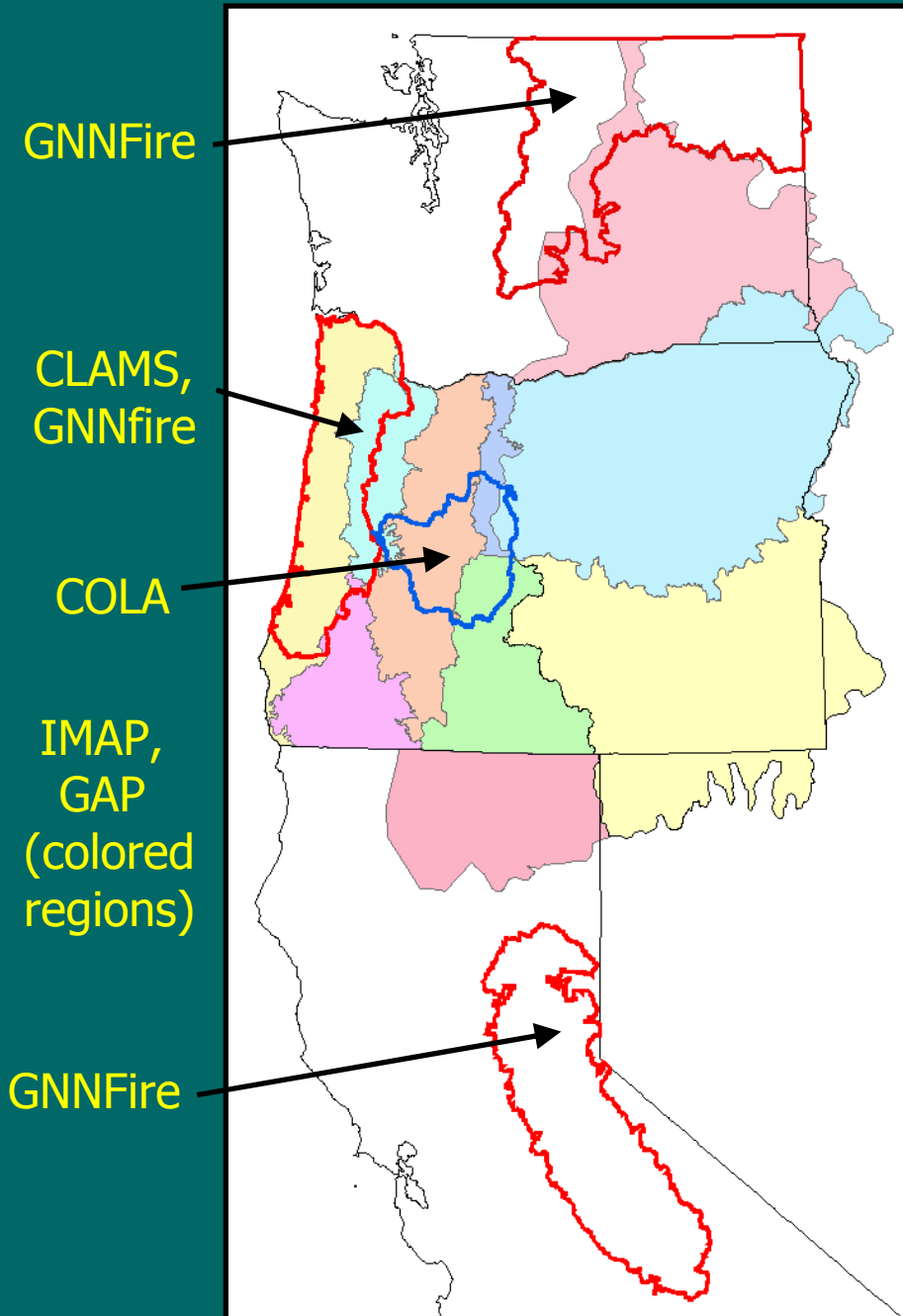
GNN vegetation mapping projects and applications

- Landscape modeling and scenario analysis: IMAP, COLA, CLAMS

- NWFP Effectiveness Monitoring

- Land management planning (Forest Plans, BLM Cumulative Effects, etc.)

- Regional risk assessment (WWETAC)

  - Fuels mapping (GNNFire), real-time fire behavior (Finney et al.)

  - Fire Learning Networks (Upper Deschutes, Sprague)

  - National 250-m study (RSAC, Brewer et al.)

- Biodiversity assessment and conservation planning (Gap Analysis Program (GAP))

- Research applications

Map labels: GNNFire; CLAMS, GNNfire; COLA; IMAP, GAP (colored regions); GNNFire
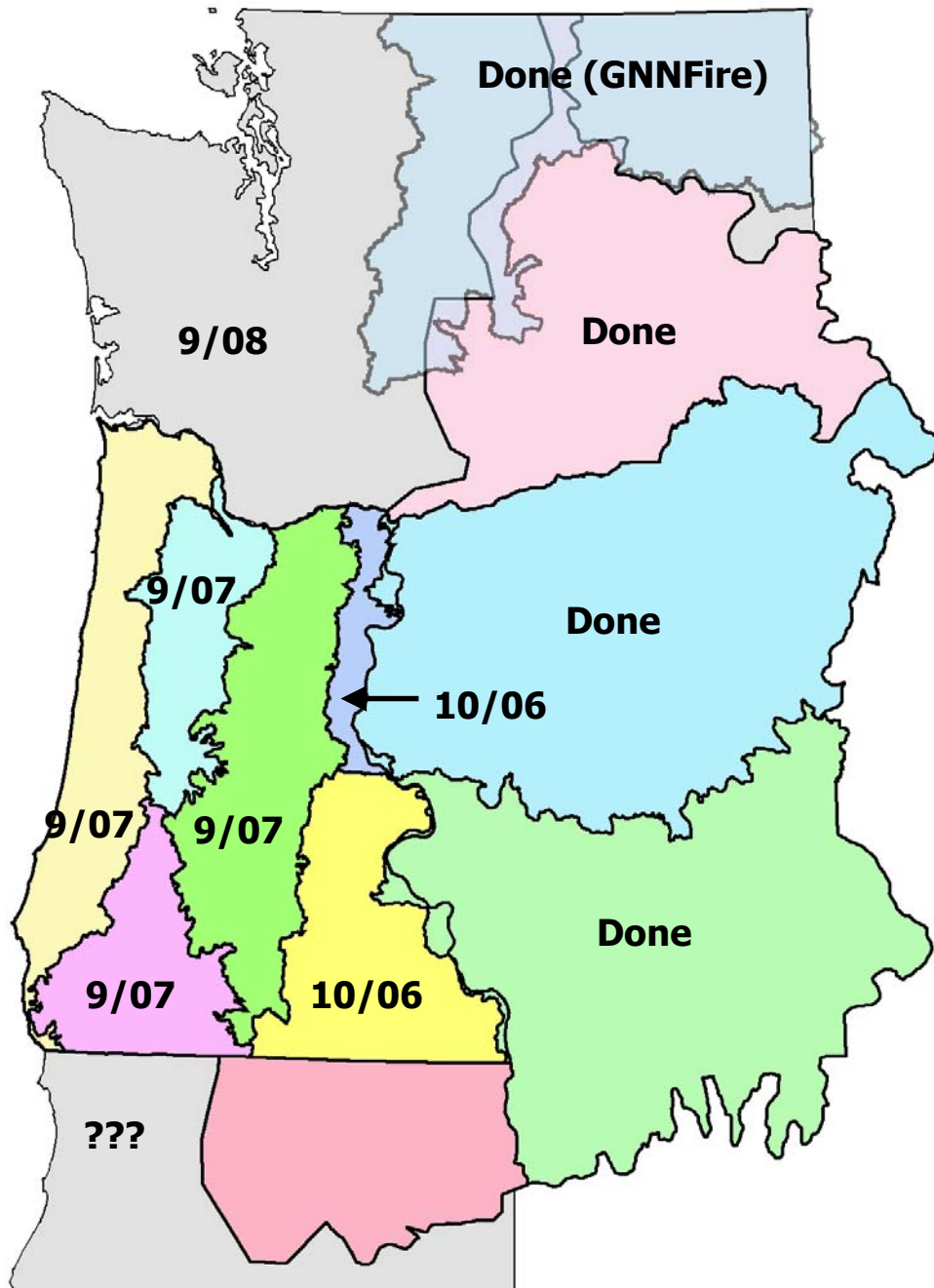
'Accelerated' Timeline for IMAP Vegetation Mapping

- NWFP area by 10/08 (CA???)

- ReGAP (Ecological Systems): all Oregon ecoregions by 12/07

- Map dates:
  - Oregon: 2000
  - Washington: 2005
  - Update/backdate to 1996, 2000, 2005 for NWFP???

Gradient Nearest Neighbor Method

Plot data

Spatial data

Statistical model

Prediction

Remote sensing

Climate

Geology

Topography

Ownership

Plot locations

Imputation

Direct gradient analysis (CCA)

Plot assigned to each pixel
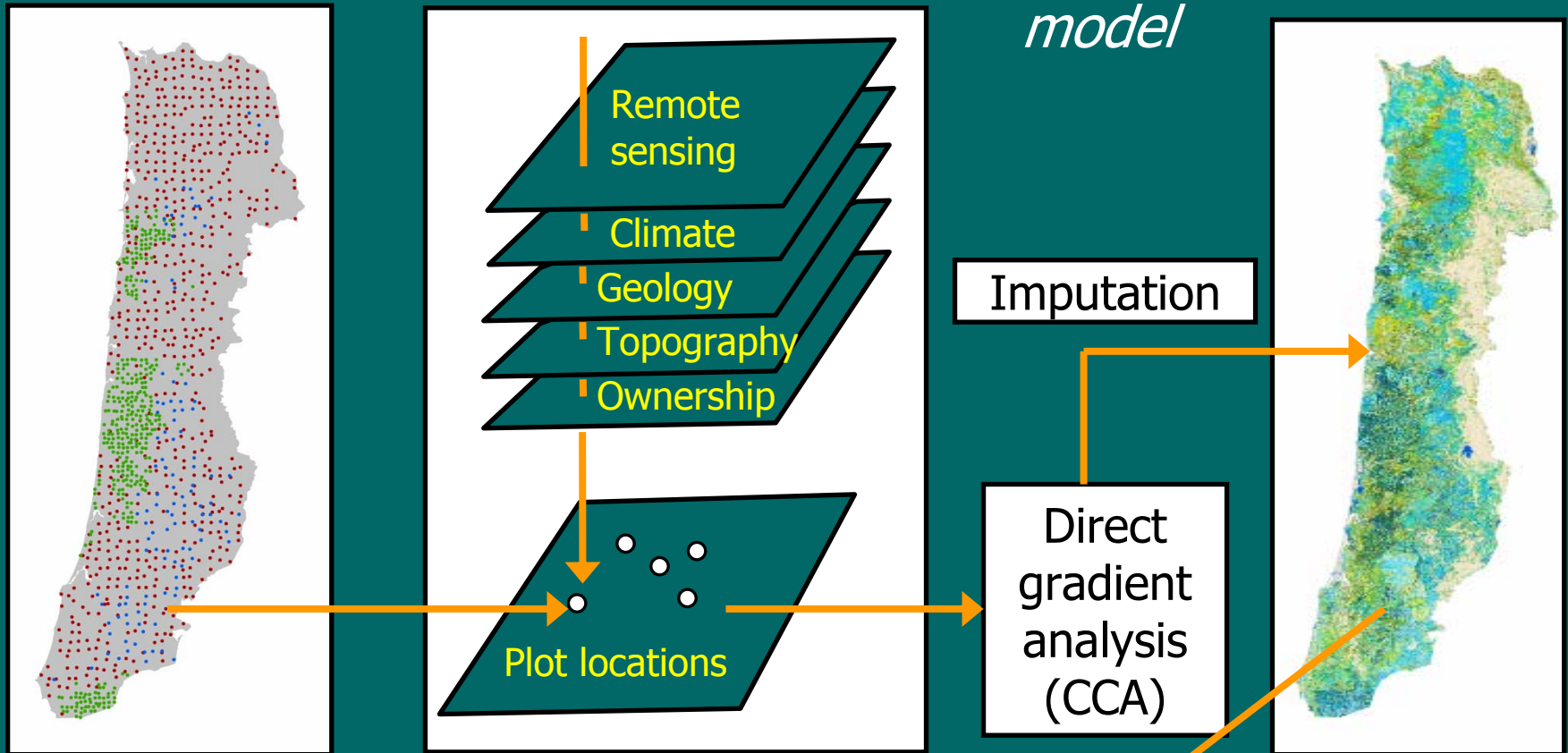
Pixel	PSME (m^2/ha)	CanCov (%)	Snags >50 cm (trees/ha)	Old-growth index	Etc...
1	11	3	7.4	0.27	...
2	79	97	2.1	0.82	...

Vegetation class from GNN - 1996

Legend:
- Open (yellow)
- Broadleaf (dark red)
- Mixed - small
- Mixed - medium
- Mixed - large
- Mixed - very large
- Conifer - small
- Conifer - medium
- Conifer - large
- Conifer - very large
- Nonforest
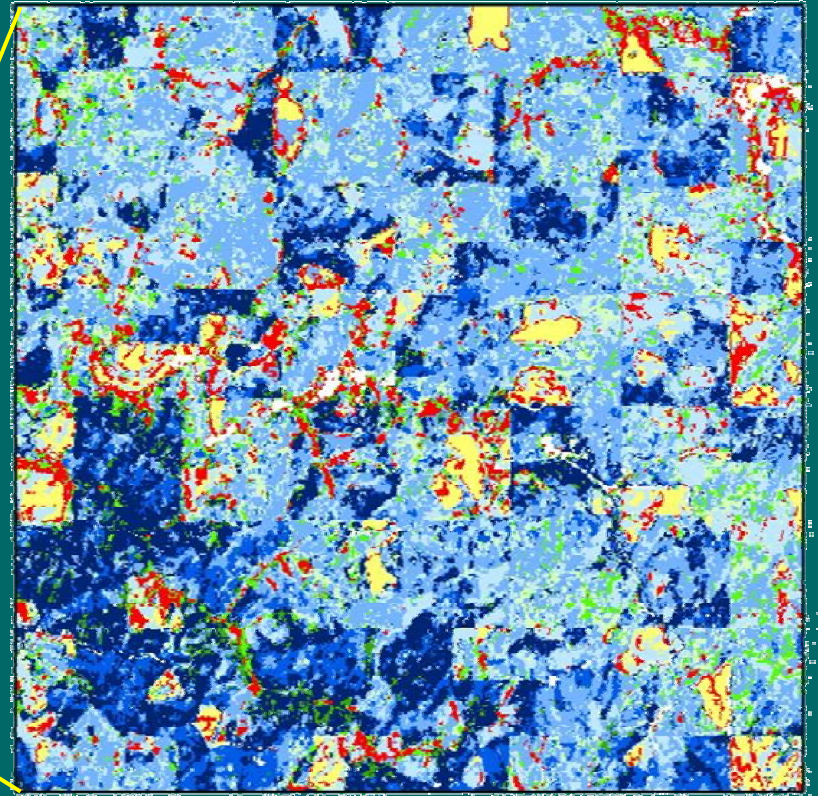
IDNO	TREE #	SPECIES	DBHCM	HTM	CC	BHAGE	TPHPLT
41034020	101	TSHE	39.116	24.384	4	83	2.617
41034020	116	CHLA	109.728	32.309	3	136	2.617
41034020	123	TSHE	55.880	39.319	3	103	2.617
41034020	129	PSME	200.152	58.826	3	913	1.000
41034020	133	PSME	66.802	40.843	3	99	2.617
41034020	316	TSHE	57.404	40.234	3	80	2.617
41034020	319	CHLA	105.664	45.110	3	244	2.617
41034020	320	CHLA	80.518	42.062	4	349	2.617

Goal: develop a map of current vegetation to support landscape modeling and analysis

Field plots

Satellite imagery

GIS data

Gradient Nearest Neighbor Method

Landscape vegetation map

Stand and landscape simulators (FVS-FFE, VDDT, TELSA, etc.)

Predicted future landscapes

Fuel models, wildlife models, etc.

Fire effects models (*FOFEM, CONSUME*)

Fuel maps

Habitat maps

Etc.

Fire behavior models (*FARSITE, FLAMMAP*)